Massachusetts Wetlands Restoration News

The Newsletter of the Partnership to Restore Massachusetts Wetlands

Fall 2002

Partners Bring Boat Meadow Creek Project to Construction

One of two wetlands restoration projects constructed on Cape Cod this summer (along with Wings Neck), the Boat Meadow Creek Salt Marsh Restoration Project enjoyed the support and involvement of a host of public and private partners. The Cape Cod Rail Trail bisects a salt marsh bordering the Boat Meadow Creek at the Eastham and Orleans town lines near the Route 6 rotary on the Cape Cod Bay side of Cape Cod. The area is part of the Inner Cape Cod Bay ACEC. The entire Boat Meadow Creek is habitat for two threatened species - diamondback terrapin and king rail.

Prior to restoration work performed in summer of 2002, a 36-inch round culvert under the bike path partially restricted tidal flow to the marsh. Large sections of the marsh became dominated by *Phragmites*. Freshwater runoff from flood events caused by heavy rainfall was partially blocked by the undersized culvert, adding to localized flooding and further reducing salinity in the marsh.

continued on page 19

Secretary of Environmental Affairs Bob Durand with (from left) Mark Forest (Congressman William Delahunt's Office), Bob Capaccio (Capaccio Environmental Engineering), Christy Foote-Smith (MWRP), Bob Scheirer (U.S. Fish & Wildlife Service), and Susan Snow-Cotter (MassCZM) unveiling sign at Boat Meadow Creek site dedication ceremony

Click here to read "Navigating This Newsletter" before using any other links.

Massachusetts Wetlands Restoration News is a publication of the Massachusetts Wetlands Restoration Program on behalf of The Partnership To Restore Massachusetts Wetlands.

Commonwealth of Massachusetts
Jane M. Swift, Governor

Executive Office of Environmental Affairs
Bob Durand, Secretary
Sharon McGregor, Assistant Secretary

Wetlands Restoration Program
Christy Foote-Smith, Director

Partnership to Restore Massachusetts Wetlands
Coordinating Committee:
Executive Office of Environmental Affairs
Executive Office of Transportation & Const.
Natural Resources Conservation Service
Environmental Protection Agency
U.S. Army Corps of Engineers
National Marine Fisheries Service
Federal Highway Administration
Mass. Assn. of Conservation Commissions
Massachusetts Audubon Society
Ducks Unlimited
U.S. Fish & Wildlife Service

Massachusetts Wetlands Restoration Program
One Winter Street • 5th Floor • Boston, MA 02018
617.626.1177 • FAX: 617.292.5850
email: wetlands.restoration@state.ma.us
Website: www.mass.gov/envir/mwrp

Inside This Edition...

Navigating This Newsletter

The best way to view this newsletter is to download it to your hard drive and then open it from there using the free Adobe Acrobat Reader software. This will ensure quick internal navigation and speedy transitions between the newsletter and external links to web sites that are viewed in your web browser software.

The reader can take best advantage of this electronic newsletter by noting the following features.

Text highlighted in **blue** indicates an internal link to related information elsewhere in the newsletter. Once that information has been accessed, just click the "Previous View" button on the Acrobat toolbar to go back to the article you were reading.

Text highlighted in **green** indicates a link to a glossary of acronyms and list of related website links. Acronyms are highlighted only the first time they appear.

Text highlighted in **red** indicates links to external web sites. When viewing this newsletter from your computer hard drive using Acrobat Reader, the web site will open in a separate web browser software window. When viewing this newsletter within your web browser from our website, clicking on an external link will open that web site and **you will leave the newsletter**. Returning to the newsletter will involve reloading the PDF file from the web site, a process that can be quite slow depending on your connection and computer speeds.

Each issue of *Massachusetts Wetlands Restoration News* includes descriptions of current restoration projects. Many of these projects involve tidal restrictions resulting from tide gates or dikes. To avoid repeating information on tidal restrictions in each article – genesis, impacts to marshes, and restoration treatments - we have added a supplemental article on tidal restrictions, and have established an electronic link (highlighted in blue) in each of the pertinent articles. After reading about tidally restricted salt marshes, just use the "return to previous view" button to go back to the project article. We hope this feature will please both our scientific audience, for its efficiency, and those who wish to learn more, for its valuable explanatory information.

Directory of Projects in this Issue

To go directly to articles discussing specific restoration sites, click on the project names:

Directory of Restoration Site Plans and Atlases

To go directly to articles discussing specific atlases and plans, click on the plan names:

GROWetlands (Groups Restoring Our Wetlands) is a collaborative public-private initiative coordinated through the Massachusetts Wetlands Restoration Program (MWRP) to support wetlands restoration projects in Massachusetts. For more information, visit MWRP's website at **www.mass.gov/envir/mwrp.**

NRCS Provides Technical Assistance on Two North Shore Projects

Eastern Point Salt Marsh, Gloucester The Eastern Point Salt Marsh restoration project, sponsored by Massachusetts Audubon Society, is set for construction this fall. The project, estimated at $45,000, involves installing a new culvert and stream channel in order to re-introduce tidal flow to a 6-acre salt marsh. The marsh has been cut off from tidal flow since a poorly-designed culvert become plugged with sand. The new culvert will be installed in a more stable location and has been designed to promote flushing and easy access for maintenance. The new stream channel will add new aquatic habitat and an interesting visual element to one of Massachusetts Audubon's most stunning sanctuaries.

Island Road Salt Marsh, Essex The Island Road Salt Marsh restoration project is slated for completion in winter 2003. Funded by the National Marine Fisheries Service, Ducks Unlimited, and CWRP partner Duke Energy, the project will be undertaken by the town of Essex Department of Public Works. A rusted and undersized metal pipe will be replaced with a three-foot by five-foot concrete box culvert, providing increased tidal flow and enhanced fish habitat to 18 acres of marsh. In addition, the culvert orientation will be shifted slightly to line up better with existing tidal creeks and prevent further erosion and scouring. After culvert installation, volunteers will carefully remove sediment that has collected in the stream channels and restore sections of marsh damaged by prior road maintenance activities.

MWRP would like to thank the Natural Resources Conservation Service for essential design and engineering work on both of these and other current restoration projects including Damde Meddowes in Hingham and the Neponset Marshes in Boston.

Three Projects Slated for Construction This Fall

Damde Meddowes, Hingham This 18-acre salt marsh restoration project, sponsored by the Trustees of Reservations at the World's End Reservation in Hingham, will be constructed late this fall. For a detailed project description see the Winter 2002 edition of the Massachusetts Wetlands Restoration News.

Cow Yard, Dartmouth The Dartmouth Natural Resources Trust has successfully obtained all of the funding anticipated for construction of the16-acre Cow Yard salt marsh restoration project in Dartmouth and, assisted by the *pro bono* services of the Boston law firm of Bingham McCutchen, is now in the process of obtaining the required environmental permits. Funding for this project is being provided by a $30,000 GROWetlands Grant from MWRP, a $30,000 FishAmerica Foundation grant through NOAA, and a $70,000 grant from the NOAA Habitat Restoration Center. Construction is expected to begin late this fall. For a detailed project description see the Winter 2002 edition of the Massachusetts Wetlands Restoration News.

Oak Island, Revere The City of Revere and MWRP are working to restore thirty acres of tidally-restricted salt marsh adjacent to the Eastern County Ditch between North Shore Road and the MBTA railroad embankment in the Rumney Marshes ACEC. This restoration project will restore tidal flows by removing a flapper valve on an existing culvert, installing a self-regulating tidegate, installing additional culverts in the MBTA railroad embankment, removing fill from the marsh, and excavating and cleaning ditches within the marsh. MWRP received a grant of $150,000 for this project from the U.S. Fish & Wildlife Service. The Massachusetts Emergency Management Act Hazard Mitigation Program, U.S. EPA, Massachusetts DEP, and the City of Revere will provide additional funding and financial support. Construction will begin in winter 2003.

Bridge Creek, Barnstable — A Race to the Finish

The March 2003 construction start date is rapidly approaching for this complex 40-acre salt marsh restoration project in Barnstable. An amazing array of project partners is working hard to ensure that this project will be permitted, funded and ready to meet the construction deadline.

The Bridge Creek project site is located at the intersection of Route 6A and the Bay Colony Railroad in Barnstable. Bridge Creek and its associated salt marsh are crossed by both the railroad and Route 6A in this area. Undersized culverts in each crossing restrict tidal flows in Bridge Creek to the upgradient marsh. During higher tides, tidal elevations in the restricted marsh are up to one and one-half feet lower than those in the unrestricted marsh. This severe tidal restriction has contributed to the domination of the upstream marshes by *Phragmites australis* and to the growth of woody vegetation in areas once dominated by salt marsh plant species. The restoration site is part of the state-designated Sandy Neck/Barnstable Harbor ACEC and is within the estimated habitat of the state-listed threatened Northern diamondback terrapin (*Malaclemys terrapin terrapin*).

The site was initially identified and studied by the U.S. Army Corps of Engineers in their 1996 *Cape Cod Wetlands Investigation* sponsored by MWRP, the Cape Cod Commission and MassHighway. The Corps found that both the railroad and Route 6A culverts were severely restricting tidal flows to the upstream marsh. Due to the prohibitive costs and issues associated with replacing a culvert beneath an active railroad, no action was taken to restore the marsh at that time.

In June 2001, the Town of Barnstable contacted MWRP with news that rail traffic would be shut down for one month in March 2003 while the Army Corps conducted maintenance work on the rail bridge over the Cape Cod Canal. Realizing that this was likely to be the only opportunity to replace the culvert beneath the railroad at Bridge Creek and restore the marsh, MWRP quickly helped the Town of Barnstable pull together a project team and began project planning.

Though the idea of restoring this important marsh was exciting, the task was daunting - designing, permitting, and hiring a contractor by a construction start date less than two years away. Who would be the lead agency? Was it even possible to restore tidal flows to the restricted wetland without flooding adjacent properties? How would the project get funded? What were the tasks that needed to be accomplished, and who would do them? MWRP immediately hired The Louis Berger Group to conduct a feasibility study for the restoration project.

Bridge Creek salt marsh

The project as designed consists of two phases. The first phase, to be constructed in March 2003, is to remove and replace an undersized 30-inch culvert beneath the railroad line with a ten-foot by ten-foot concrete box culvert. The second phase of the project, to be constructed in late 2003, is to remove and replace the undersized three-foot by five-foot culvert beneath state Route 6A with a ten-foot by ten-foot concrete box culvert.

As of this writing, the project design is complete and permit applications have been submitted. Partial funding has been raised and applications have been filed for grants to cover the balance of project costs.

The project sponsor is the Town of Barnstable. Project partners and contributors include MWRP (GROWetlands Grant Program), Massachusetts Executive Office of Transportation and Construction, Cape Cod Watershed Team, Massachusetts Watershed Initiative, Cape Cod Conservation District, Massachusetts Division of Marine Fisheries, CWRP (EarthTech, The Gillette Company, and Weston & Sampson Engineers), Natural Resources Conservation Service, Bay Colony Railroad, Barnstable Land Trust and Ducks Unlimited.

Bridge Creek Restoration by the Numbers:

Number of acres to be restored: **40**
Number of culverts to be replaced: **2**
Size of replacement culverts:
ten-foot by ten-foot box culverts
Number of permits and approvals necessary for project: **11**
Number of public meetings held to date to discuss project: **5**
Number of CWRP partners contributing to project: **3**
Number of project partners/contributors: **15**
Total estimated project cost (including management, design, permitting, construction and monitoring):
$883,000

State Game Farm Site to Be Restored in Sandwich

A former state-owned pheasant farm and trout hatchery is the site of one of MWRP's newest GROWetlands projects on Cape Cod. The Old State Game Farm in East Sandwich is now a 133-acre nature preserve owned by MassWildllife and managed by the Thornton Burgess Society. Located within the Sandy Neck/Barnstable Harbor ACEC, the historic site contains salt and freshwater marshes, upland forests, meadows, and a scenic stretch of Scorton Creek.

Degraded salt marsh at State Game Farm

The site also contains a dam that was built over a small tidal tributary of Scorton Creek in order to impound freshwater. A small culvert with a one-way, "flapper"-type tide gate was installed to allow excessive freshwater to drain from the impoundment while restricting tidal flow. Over the years the impoundment, lacking the daily ebb and flow of tides, became stagnant and crowded with *Phragmites.* However, in October 1991 the infamous "Perfect Storm" damaged the tide gate and some tidal water began to flow once again into the degraded salt marsh.

With concerns about erosion, structural integrity and the health of the salt marsh, the Thornton Burgess Society began investigations of the dam when they assumed management responsibility for the site in 1996. This led, eventually, to the condemnation of the dam by the Massachusetts Office of Dam Safety. The inspector's report recommended complete removal of the dam and the concrete structure comprising the culvert.

MWRP, along with the National Marine Fisheries Service, Ducks Unlimited, and MassWildlife, is now working to develop a plan focusing on removing the dam and reconstructing an open channel. Initial land surveying and hydrologic studies intended to assess the feasibility of this option are set to begin this fall. Eventually, restored tidal flow will improve conditions to about six acres of salt marsh. Because the dam also acts as a stream crossing, the project design will include a bridge over the restored channel, if preliminary studies support complete dam removal.

This project may have benefits beyond restoring six acres of salt marsh. The complex of estuary, salt marsh, freshwater creeks and ponds once supported an active herring run. The connection between the herring's spawning site, Nye Pond, and the ocean, is now obstructed by several road and railroad crossings, redirected stream channels, and remaining structures from the long-abandoned trout hatchery. Restoration of this historic anadromous fish passage would be a fitting use of an area once used to farm non-native fish. MWRP hopes to incorporate elements of this aspect of the project into the preliminary project design.

MWRP Receives National Recognition

MWRP Director Christy Foote-Smith

MWRP Director Christy Foote-Smith traveled to Washington, DC in May to receive a 2002 National Wetlands Award for Outstanding Wetlands Program Development. The program honors "exceptional individuals who have demonstrated extraordinary effort, innovation, and excellence in wetland conservation through programs or projects at the regional, state, or local level." Program co-sponsors include U.S. Environmental Protection Agency, U.S. Department of Agriculture, U.S. Forest Service, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Natural Resources Conservation Service.

Grant Awards and Grant Opportunities

Massachusetts Wetlands Restoration Grant Program MWRP has renamed the GROWetlands Grant Program. The GROWetlands Initiative is the mechanism through which MWRP and its partners provide technical, monetary and other assistance to projects. Project sponsors have occasionally thought that acceptance as a GROWetlands project was the same as a grant award. The name change should eliminate this confusion.

2002 GROWetlands Grants have been awarded to:

- Town of Lexington, Lincoln Park Wetland Restoration, $20,000
- Town of Barnstable, Bridge Creek Salt Marsh Restoration, $50,000
- Town of Dartmouth, Cow Yard Salt Marsh Restoration, $30,000

MWRP plans to post the solicitation for Fiscal Year 2004 Massachusetts Wetlands Restoration Program Grants in December 2002. Check the MWRP website at www.mass.gov/envir/mwrp in early December for more information.

Gulf of Maine Council/NOAA Habitat Restoration Grants Massachusetts fared very well in the first round of this new grant program with eight projects funded for a total of $170,505. Four of these were GROWetlands projects (see list below). A new solicitation has been issued and can be accessed at the Gulf of Maine website. Applications are due November 15, 2002. MWRP is available to provide guidance to potential applicants with eligible wetland restoration projects.

GROWetlands Projects Receive Grant Funds GROWetlands projects are the recipients of many grants from a variety of grant sources, often with direct assistance and support from MWRP. In addition to MWRP's GROWetlands Grants and support provided through the Corporate Wetlands Restoration Partnership, examples of recent grant awards made to MWRP-supported projects include:

U.S. Fish and Wildlife Service, National Coastal Wetlands Conservation Grant

Oak Island, Revere - $150,000
Namskaket Marsh, Brewster -$45,000

Habitat Restoration Grants, National Oceans and Atmospheric Administration

Cow Yard, Dartmouth - $70,000

Fish America Foundation/NOAA Habitat Restoration Grants

Cow Yards, Dartmouth - $30,000
Eastern Point, Gloucester - $20,000
Damde Meddowes, Hingham - $15,000

National Fish & Wildlife Foundation

Assabett National Wildlife Refuge - $20,000
Quivett Creek, Dennis/Brewster - $19,000
Damde Meddowes, Hingham - $5,000
Mary Chase Marsh, Eastham - $10,000
Boat Meadow Creek, Eastham/Orleans - $20,000

Massachusetts Watershed Roundtable, Executive Office of Environmental Affairs

Barneyville Marsh, Swansea – $17,000
Bridge Creek, Barnstable - $50,000

Section 206 Habitat Restoration, U.S. Army Corps of Engineers

Stewart's Creek, Barnstable - 65% federal cost share, project cost to be determined

Section 1135, U. S. Army Corps of Engineers

Broad Meadows, Quincy – estimated 75% federal cost share of $4,300,000.
National Marine Life Center, Bourne – estimated 75% federal cost share of $543,750

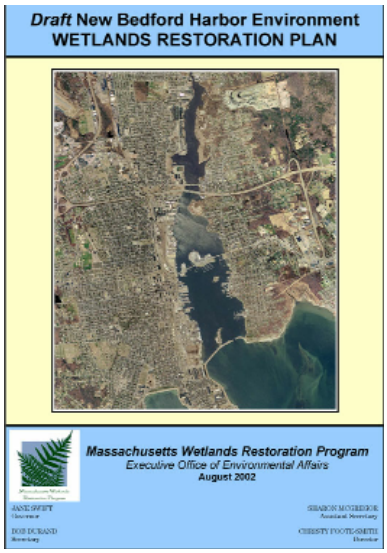
Wildlife Habitat Improvement Program, Natural Resources Conservation Service

Damde Meddowes, Hingham - $45,000
Wings Neck, Bourne – $10,000

A number of additional grant applications are currently pending. GROWetlands projects are considered Coastal America projects by our federal partners and receive priority consideration for their grants and assistance programs.

Area to be restored to salt marsh at Damde Meadows, World's End, Hingham, Massachusetts

MWRP Drafts Restoration Plan for New Bedford Harbor Environment



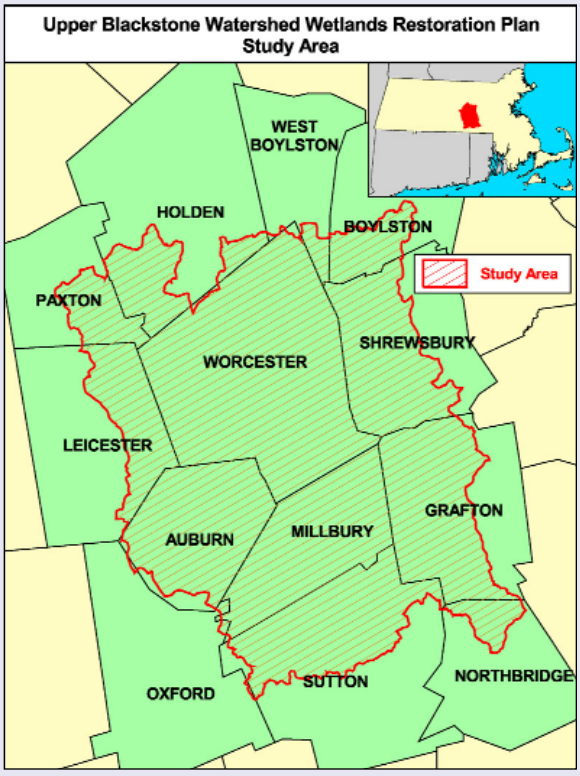
In August 2002 MWRP produced the *Draft New Bedford Harbor Environment Wetlands Restoration Plan.* The draft plan provides maps and summary descriptions for 69 potential wetland restoration sites within the towns of Acushnet, Dartmouth, Fairhaven and New Bedford. It identifies both tidal and freshwater sites that have been filled, drained, impounded or tidally restricted. A public meeting was held on October 10th to present the draft plan to the study area communities and to receive public comments.

MWRP produced the draft plan under a grant from the New Bedford Harbor Natural Resource Damages Trustee Council. The Council (comprised of NOAA, the Massachusetts Executive Office of Environmental Affairs, and U.S. Fish and Wildlife Service) administers a multi-million dollar Natural Resource Damages Trust Fund - derived from Superfund settlements with polluters of New Bedford Harbor - that is dedicated solely to the restoration of coastal resources and human uses. The inventory of potential restoration sites in the draft plan will help the Council select the best, most environmentally significant projects to support through the Trust Fund. It will also provide communities with the information they need to make informed wetland restoration decisions. A few sites identified in the draft plan have already produced some interest and initial action is being taken at the Winsegansett Reserve Marshes.

After the public hearing and the close of the public comment period, MWRP will produce a final plan that will be distributed to a broad group of Harbor stakeholders. MWRP and the Council will pursue a limited number of priority sites as demonstration projects. MWRP staff will also work with Harbor communities and others interested in wetlands restoration to help implement as many projects as possible. To receive a digital CD copy of the draft plan in PDF format, email a request to hunt.durey@state.ma.us.

Upper Blackstone Study Begins

MWRP and the Worcester County Conservation District have teamed up to begin work on the *Upper Blackstone River Watershed Wetlands Restoration Plan.* The Conservation District received a 604b Planning Grant from DEP to produce the plan. MWRP will use GIS tools, extensive field work, and consultation with watershed communities and other officials to locate, map, and describe potential wetland restoration sites in the study area. A draft plan should be completed by early 2003.



Local Efforts Key to Success at Wings Neck

Several years ago, local residents set their sights on restoration of 8 acres of deteriorating salt marsh adjacent to Wings Neck Road in Bourne. This summer, with lots of help from local, state and federal agencies, their dream became a reality.

Prior to the restoration work, a 24-inch round culvert in Wings Neck Road partially blocked tidal flows from Pocasset Harbor to the upgradient marsh and prevented the marsh from draining properly following large storm events. This restriction of tidal flow lowered salinity levels in the marsh encouraged encroachment of woody vegetation and decreased the area of marsh available to fish and other aquatic organisms.

Tidal flow has been improved with the installation of two three-foot by four-foot culverts under Wings Neck Road. MWRP, the Town of Bourne and a local citizen conducted baseline monitoring of the site during fall 2001. Vegetation and soil salinity will be monitored every other year for five years to track changes resulting from increased tidal flow.

Salt marsh restoration at Wings Neck has been successful because of the contributions and participation of many public and private partners including the Town of Bourne, MWRP (providing technical assistance and a GROWetlands Grant), CWRP (technical services donated by Stephen J. Doyle & Associates and Warwick & Associates), Coastal America Partnership (U.S. Fish & Wildlife Service through the FishAmerica Foundation, Natural Resources Conservation Service's Wildlife Habitat Incentives Program), Buzzards Bay Project, Cape Cod Conservation District, Wings Neck Trust, Pocasset Village Association, Beacon Point Association, Winnepoc Homeowners Association, Barlows Boat Yard, and other concerned local citizens. The total cost of the project, including follow-up monitoring, was about $110,000.

Under the GROWetlands Initiative, MWRP and the Town of Bourne previously collaborated on the Barlow's Landing Road Salt Marsh Restoration Project completed in 1999 and have agreed to investigate potential future projects at Gray Gables and Hen's Cove, as well a possible second phase of restoration at Wings Neck.

New MWRP Publications Available Online

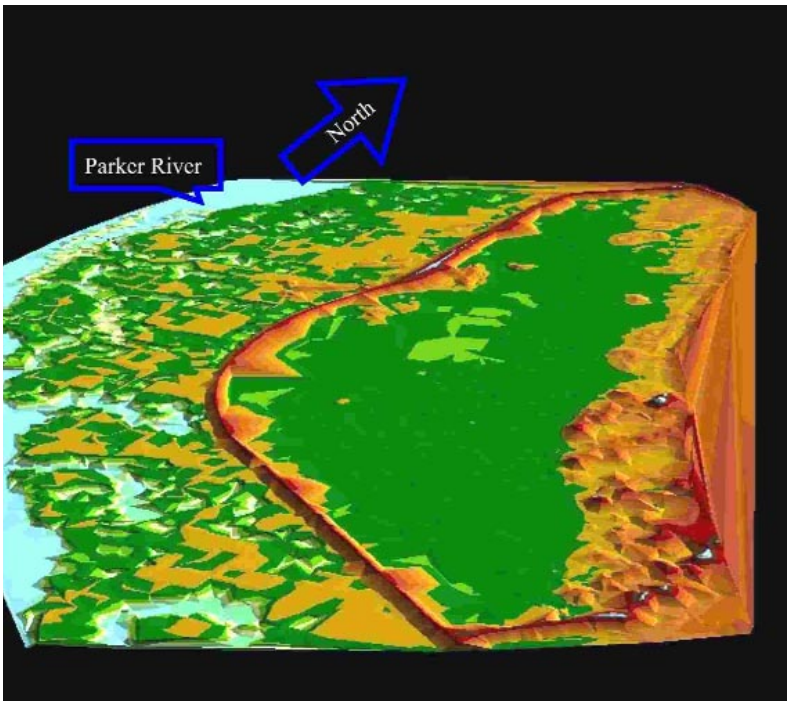
A 2001 Progress Report detailing wetlands restoration activities and accomplishments can be found on the publications page of the MWRP website at www.state.ma.us/envir/mwrp/publications.htm in PDF format. The report includes a separate document containing detailed profiles of twelve projects completed during 2001. The report notes the following accomplishments for the program from 1994-2001:

- Projects Completed: Inland - 6, Coastal – 17, Total - 23
- Acres Restored: Inland - 51, Coastal - 288, Total – 339
- GROWetlands Agreements signed: 47
- GROWetlands Grants Awarded: 9 grants totaling $158,609 (not including 2002 GROWetlands Grant awards)

Another report entitled "GROWetlands Site Profiles – August 2002" is also available on the website in PDF format. This document provides detailed information about a number of restoration projects currently under development.

Public and Private Partners Team Up at North Pool on Plum Island

MWRP and the U. S. Fish & Wildlife Service are pleased to be working with a team of survey and photogrammetry specialists at the North Pool salt marsh restoration on the Parker River Nartional Wildlife Refuge (for a complete project description see Massachusetts Wetlands Restoration News, Winter 2002). Contributing services worth more than $35,000 through the Corporate Wetlands Restoration Partnership, Col-East, Inc. and Clipper City Survey have provided the project sponsors with a highly detailed aerial photograph and topographic map of the site. In addition, Normandeau Associates has worked closely with the mapping team as they continued their own voluntary work through CWRP focusing on preliminary project design and site assessment.



Survey data was used to create this 3-D image of the North Pool.

From a distance, salt marshes appear to be vast expanses of flat peatland, level planes broken only by the occasional tidal ditch or bedrock outcrop. But a closer view of a marsh - even better, walking through one - reveals more complicated patterns. Swaths of tall cord grass (*Spartina alterniflora)* grow along the ditches, in closely proximity to the twice-daily high tides. Moving away from the ditches over a barely discernable rise of the marsh surface, other plant species form a distinctly different pattern and texture. Here, the much shorter salt hay grass (*Spartina patens*) is swept into "cow-licked" patches by only the highest tides several times per month. Walking further toward the upland, again rising imperceptibly by several inches, both Spartina species may give way to spike grass (*Disticlis spicata*) black grass (*Juncus gerardii*), and other plants able to withstand occasional saltwater inundation.

The North Pool is a typical example of how these subtle changes in topography create a diverse mosaic of microhabitats, which in turn support a variety of plant and animal species. This is one reason why salt marshes are prized as highly productive and essential components of coastal ecosystems. Knowledge and awareness of microtopography can be a key factor in determining how the marsh will respond when actions are taken to restore its natural functions.

Around 1950, about 160 acres of salt marsh were destroyed when a berm was constructed to impound freshwater. The impoundment was intended to attract black ducks to a brackish wetland. As tidal saltwater was restricted from the marsh and freshwater filled the impoundment, salt marsh hay, black grass, and spike grass were replaced by invasive freshwater species such as cat-tail, purple loosestrife, and *Phragmites.* Slightly lower areas that were *Spartina alterniflora* are now likely submerged under freshwater most of the time.

When considering reopening impoundments to tidal flow, the microtopography of the marsh surface must be known in order to predict how plants will respond and, ultimately, to assess the potential benefits gained from restoration actions. In many cases, salt marshes impounded with fresh water subside over time because the marsh's peat substrate decays. In these cases, reintroduction of tidal flow may not restore natural salt marsh plant communities and other restoration actions would be needed.

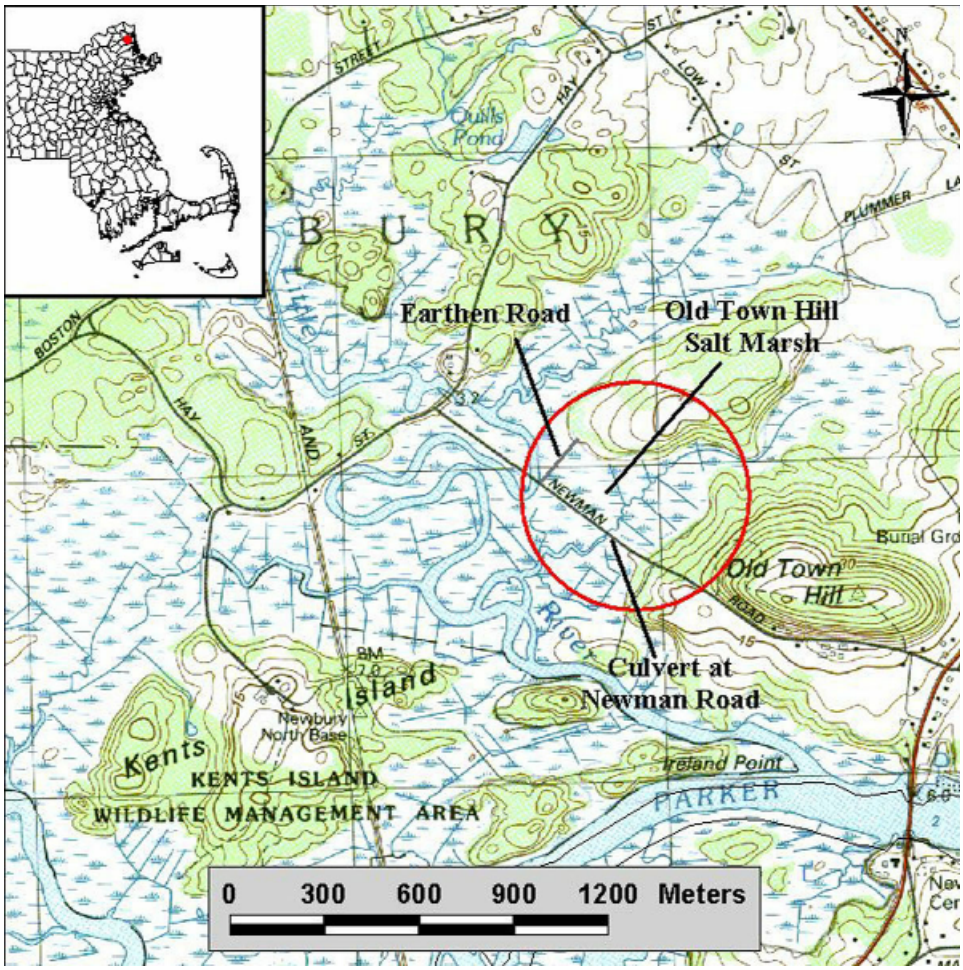
To address this need, Col-East, Inc., an aerial photo and mapping company from North Adams, flew over the site in December 2001 and captured new aerial photographs. U.S. Fish & Wildlife Service spent about two weeks mowing the project area prior to the flight to enable mapping technicians to see the ground better in the photographs. Clipper City Survey of Newbury spent countless hours at the project site establishing ground control coordinates for use in aerial photo interpretation and establishing survey benchmarks near the project location for this and other survey needs. Clipper City was assisted in this effort by Bruce Berry, a geodetic specialist based in Maine.

continued on page 12

Two Restoration Projects Planned at Old Town Hill in Newbury

The Old Town Hill Salt Marsh is a 20-acre salt marsh located just north of Newman Road and east of the Little River in Newbury. Two tidal restrictions were identified at this site in the 1996 *Tidal Crossings Inventory and Assessment* prepared by the Parker River Clean Water Association. Project sponsors have been identified and restoration projects are now under development to address both tidal crossings.

The first tidal restriction is a small earthen road that runs perpendicular to Newman Road and joins the adjacent upland known as Old Town Hill Reservation. An 18-inch culvert beneath the earthen road near its intersection with Newman Road restricts direct tidal flow from the Little River. The culvert is too small to convey higher tides. The eastern portion of Old Town Hill Salt Marsh receives tidal influence from the Little River only during the highest of high tides, when the tidal elevation is great enough to over-top several low sections of the earthen road.



Two Restoration Projects Planned at Old Town Hill in Newbury

The challenge of this project will be to improve tidal flushing across the earthen road while maintaining both vehicular access for maintenance crews and pedestrian access for visitors to the Old Town Hill Reservation. One approach under investigation is the use of "hardened" (stone-reinforced) swales. By replacing the road with lower-elevation hardened swales in several locations, the road will no longer dam tidal waters. The swales may also improve fish access to the marsh. Additionally, allowing higher salinity tidal waters to flush the salt marsh may help prevent the expansion of the invasive *Phragmites.*

MWRP has signed a GROWetlands Agreement with the Trustees of Reservations in support of this project. In June 2002 the Trustees received a $10,000 grant from the Gulf of Maine Council for the restoration at the Old Town Hill Salt Marsh. The project is also a recipient of pro bono environmental services through CWRP. Beals and Thomas, Inc. will provide much needed survey and permitting services for this project.

Tidal flow to the Old Town Hill Salt Marsh is also restricted on the southern border of the marsh at Newman Road by a 48-inch diameter corrugated metal culvert that conveys an unnamed tidal channel. According to both the 1996 *Tidal Crossings Inventory and Assessment* and data collected by MassCZM, this culvert restricts the tidal range between the upstream and downstream tides by more than 30 inches. While the road and culvert cannot be completely removed, the undersized culvert can be replaced with a larger structure, such as a box culvert, designed to accommodate greater volumes of water and restore more natural tidal flushing to the upstream salt marsh.

MWRP is pleased to announce that the Merrimack Valley Planning Commission has signed a GROWetlands Agreement with MWRP and has agreed to coordinate with the Town of Newbury and MWRP, through Eight Towns & The Bay on this second project.

Rumney and Belle Isle Marshes ACEC Plan Completed

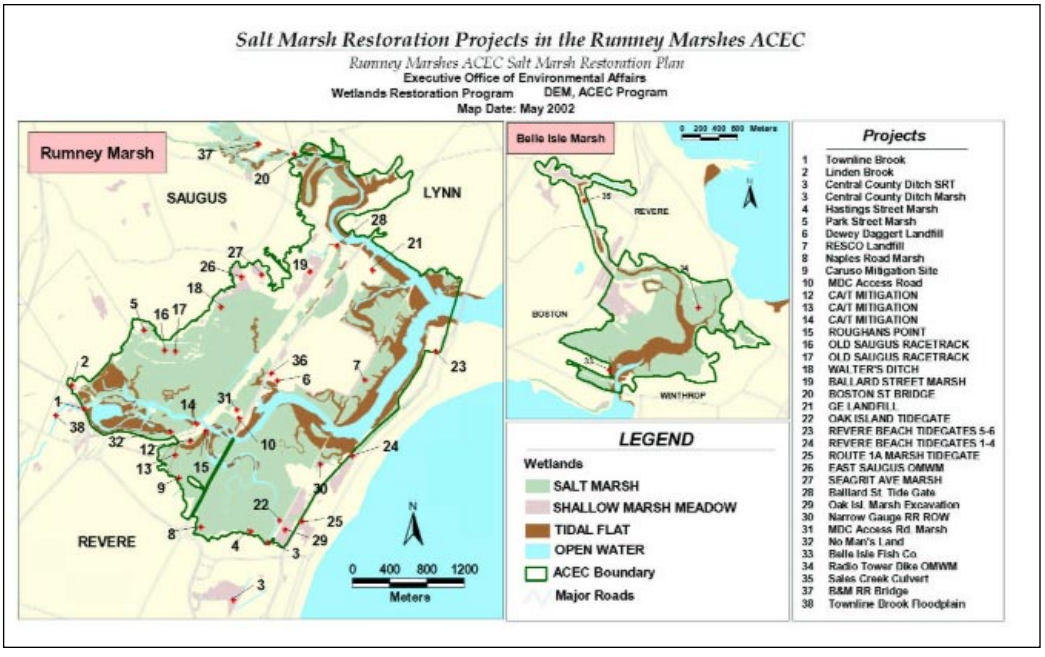
MWRP has released the final version of the *Rumney Marshes ACEC Salt Marsh Restoration Plan.* In collaboration with the ACEC Program, MWRP identified and assessed more than 200 acres of potentially restorable salt marsh within the 2,600 acre ACEC.

The Rumney Marshes ACEC, located in Lynn, Saugus, Revere, Boston, and Winthrop, has been characterized by the U.S. Fish & Wildlife Service as one of the most biologically significant estuaries in Massachusetts. The ACEC contains more than 1,850 acres of salt marsh, mud flats and other aquatic habitats that support an extraordinary diversity of fish, birds and other estuarine wildlife species. Five species of rare state-listed birds are known to nest within the ACEC. The ACEC is comprised of two distinct habitat complexes - Rumney Marsh proper and Belle Isle Marsh.

Despite the apparent richness of the ACEC, more than 300 years of urban development within and around the Rumney Marshes has significantly impaired its ecological integrity. Route 107, also known as the Salem Turnpike and one of the first stagecoach roads built between Boston and the North Shore, runs through the heart of the marsh. Constructing the road required filling dozens of acres of salt marsh and tidal stream channels. In relatively modern times, the proposed construction of Interstate 95 during the 1960s resulted in filling over 140 acres of the marsh with approximately one million cubic yards of fill before the project was abandoned in 1972. These infrastructure projects, and many others on smaller scales, have drastically altered long-established tidal and freshwater hydrodynamics, indirectly leading to reduced salinity levels within the salt marsh, increased impacts from sediment and stormwater run-off, and the proliferation of invasive plant species, most notably *Phragmites*.

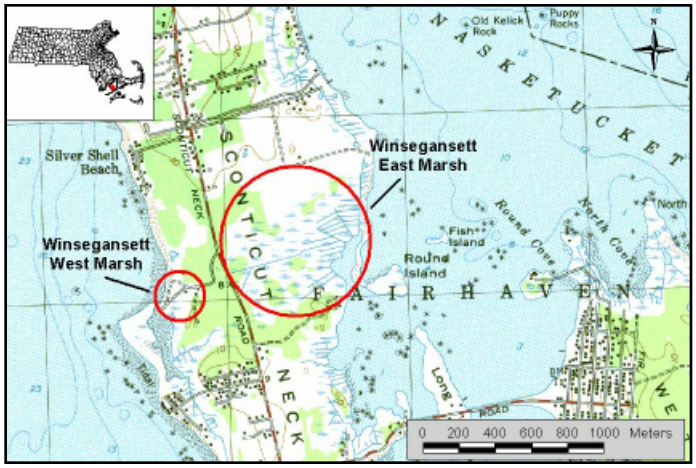
Fortunately, removing restrictions to tidal flow, excavating filled marshes, and taking other steps to restore salt marshes, can minimize some of this damage. The plan identifies more than 30 potential restoration project sites and encompasses more than 200 acres of the ACEC. Since the initiation of the original planning process in 1996, almost half of these projects have been constructed. Projects have been implemented both voluntarily and for compensatory mitigation with coordination by a partnership of local, state, federal, and non-governmental agencies and organizations. Included among these projects are the reconstruction of the Town Line Brook tide gates along Route 1 in Revere, the installation of Massachusetts' first self-regulating tide gate in the Central County Ditch and the excavation of 30 acres of filled salt marsh near Park Street in East Saugus.

As for the remaining restoration projects in the Rumney Marshes ACEC, the plan identifies several high priority projects in varying stages of development. Among the most critical salt marsh restoration projects waiting to be implemented in Rumney Marsh are the installation of a new culvert and self-regulating tide gate near Oak Island in Revere and the restoration of the Ballard Street salt marsh in Saugus. The Oak Island project is ready for construction this fall and should be completed next year. MWRP is working with local project sponsors to continue preliminary planning and design for the Ballard Street project. Due to its great complexity, the Ballard Street salt marsh restoration likely remains several years from implementation. Taken together, however, the Oak Island and Ballard Street projects will result in more than 60 acres of restored and enhanced salt marsh, greatly increasing the ecological and societal values of the ACEC. MWRP will remain involved in these projects through post-construction monitoring and will also work to develop and implement the other remaining projects in the plan based on local support and community priorities.



Winsegansett Reserve Marshes in Fairhaven Targeted for Early Action

With the "ink still wet" on the *Draft New Bedford Harbor Environment Wetlands Restoration Plan,* the NOAA Restoration Center, on behalf of the New Bedford Harbor Trustee Council, is planning an investigation of one of the plan's priority sites. NOAA, in collaboration with MWRP and the Bristol County Mosquito Control (BCMC), is exploring restoration options at the Winsegansett Reserve Marshes on Sconticut Neck in Fairhaven.



This site includes an 80-acre tidal marsh on the eastern side of Sconticut Neck (Winsegansett East Marsh) that borders Nasketucket Bay as well as a much smaller tidal marsh system on the western side of Sconticut Neck (Winsegansett West Marsh). Approximately 57 acres of the Winsegansett East Marsh is owned by the Fairhaven-Acushnet Land Preservation Trust and will be the focus of restoration efforts. Winsegansett West Marsh is predominantly on private property and the owners are highly supportive of the proposed restoration efforts.

Winsegansett East Marsh has been affected by both past and on-going human activities. The marsh was extensively ditched for mosquito control as early as 1910. No ditching activities have occurred in the marsh for more than 30 years and the ditches now largely consist of narrow channels colonized by a low marsh community dominated by smooth cordgrass (*Spartina alterniflora*). Extremely low salinities have resulted in the rapid spread of *Phragmites* that now dominates as much as 35 acres of the upper marsh and that will likely continue to spread. A partially blocked culvert beneath a gravel road tidally restricts a one-acre portion of the Winsegansett West Marsh. The marsh system is further compromiseed by the presence of earthen fill and a concrete structure.

The goal of this potential wetland restoration project will be to restore and enhance the ecological function of the marsh by improving tidal flushing, controlling *Phragmites*, and increasing the cover and biological diversity of a *Spartina*-dominated marsh. NOAA, in collaboration with MWRP and BCMC, has identified several potential restoration activities. The growth and expansion of *Phragmites* may be controlled by restoration techniques such as mowing and applying herbicide during appropriate growth stages, altering the ditch network, lowering the marsh plain, controlling excess nutrient releases, and constructing one or more tidal creeks. The culvert that restricts flow to Winsegansett West Marsh may be replaced with an alternative structure to improve tidal exchange. An investigation will also be conducted to assess the potential for removing the concrete debris and/or modifying the fill area on the West Marsh to restore a coastal habitat community such as salt marsh or dune habitat.

This potential wetland restoration project is only one of a number of excellent restoration opportunities identified in the plan.

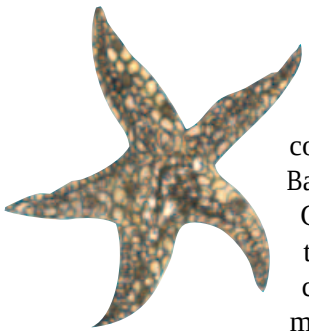
Public and Private Partners Team Up at North Pool on Plum Island *continued from page 9*

To complete the project, all of the ground survey data was sent back to Col-East, where technicians developed a highly detailed topographic survey of the project site. Several thousand spot elevations throughout the 160-acre project area were used to generate contour lines showing every six-inch change in elevation. The resulting data and images will be used by other project designers to model the expected changes to the site brought about by the re-introduction of tidal flow and to precisely gauge the volume, extent and duration of tidal flooding required to restore the natural function of the degraded salt marsh.

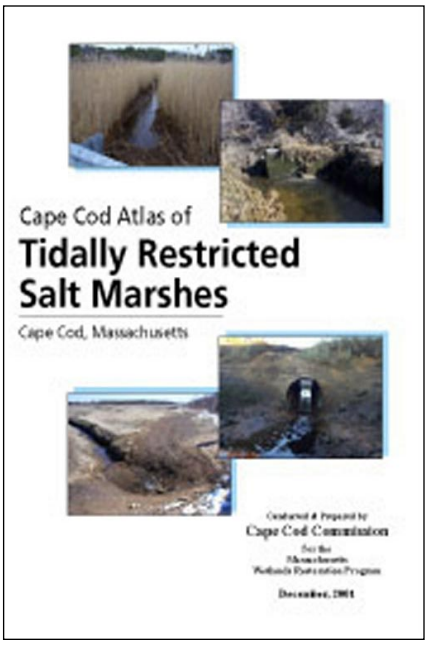
The topographic map and data developed by this unique partnership will be an invaluable tool as planning for the North Pool project continues. MWRP, CWRP and the U.S. Fish & Wildlife Service would like to thank the individuals involved for their enormous contributions – Joe Simon and Ed Dixon, Clipper City Survey; Mark Thiasz, Col-East; Bruce Berry, Survey & Geodetic Consultants; and Patrick Fairbairn and Sarah Allen, Normandeau Associates.

Efforts to Document Tidal Restrictions Progress

MWRP, with the help of several partners, is now several steps closer to documenting the locations and features of tidal restrictions along the entire Massachusetts coast. Since publication of the Winter 2002 edition of *Massachusetts Wetlands Restoration News*, our partners have completed two more tidal restriction atlases covering Cape Cod and Buzzards Bay (see descriptions below). Combined with earlier atlases for the North and South Shores, the completion of these new studies means that MWRP now has an inventory of tidal restrictions covering the majority of the Massachusetts coastline. Areas that remain to be inventoried included Boston Harbor, Nantucket and Martha's Vineyard, and the coastline west of the Buzzards Bay watershed. MWRP recently initiated a new atlas project to complete the area west of Buzzards Bay (Taunton River and Narragansett Bay) and intends to do the same for Boston Harbor in the near future (see below).

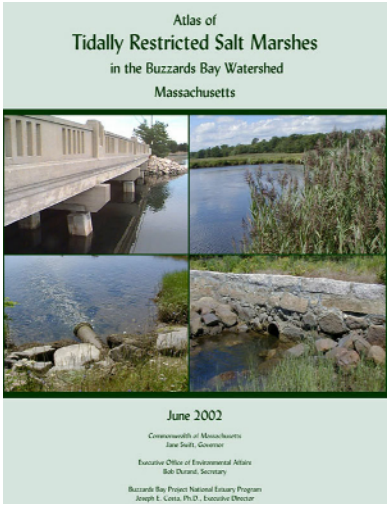


The purpose of these atlases is to record the locations and attributes of tidal restrictions so that local, state and federal groups have the information they need to identify, prioritize and initiate coastal wetland restoration projects. The atlases assist efforts to incorporate wetlands restoration into planned infrastructure projects and to target environmentally significant sites that are appropriate for investment of public resources.



Cape Cod Atlas Completed

In December of 2001 the Cape Cod Commission completed the *Cape Cod Atlas of Tidally Restricted Salt Marshes.* MWRP contracted with the Commission to produce the atlas and provided the primary funding for the project. MassCZM and the Massachusetts Bays National Estuary Program contributed additional funding and staff. The atlas identifies 114 sites within 14 Cape Cod towns where tidal flows are restricted by various human structures. MWRP and other partners are now working on several projects that will restore hundreds of acres of Cape Cod wetlands that have been degraded by tidal restrictions. Follow-up work on sites identified in the atlas has revealed the realistic potential to restore over two thousand acres of degraded salt marsh on Cape Cod. The atlas can be viewed or downloaded from the Cape Cod Commission web site at www.capecodcommission.org/tidalatlas.



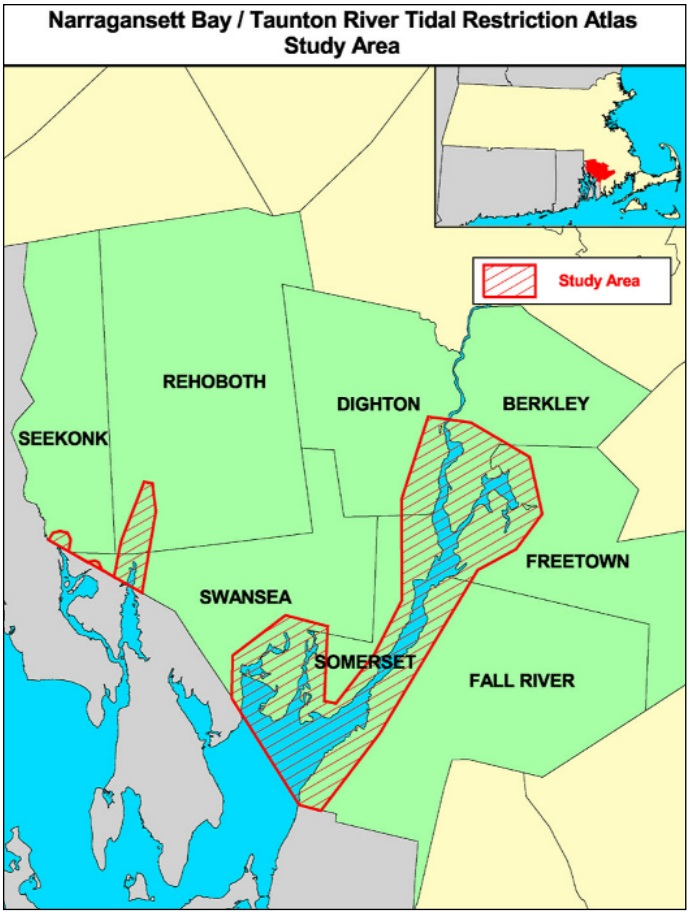
Buzzards Bay Atlas Completed

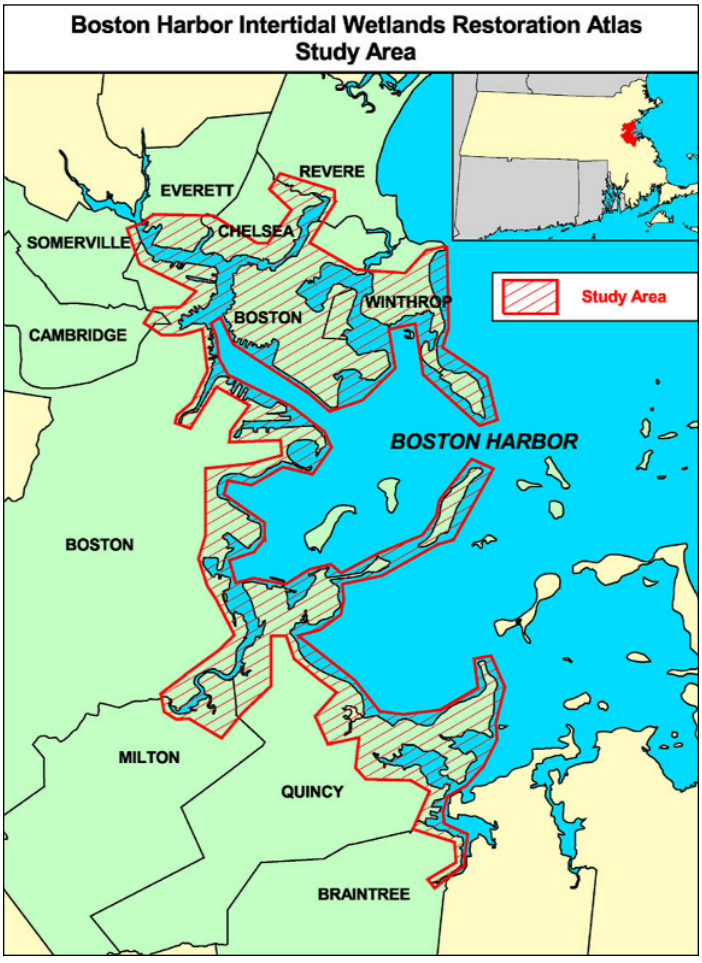
In June 2002 the Buzzards Bay Project completed the *Atlas of Tidally Restricted Wetlands in the Buzzards Bay Watershed.* The atlas was funded primarily by MWRP, with additional resources provided by the Massachusetts Environmental Trust and DEP. It identifies 257 tidal restriction sites within 9 towns in the Buzzards Bay watershed and profiles 31 priority sites. Local communities, government agencies and other groups have been working with MWRP for a number of years on restoration projects in this watershed, and several projects have already been completed. The final atlas now provides restoration advocates with a complete picture of the watershed's tidally restricted wetlands and will greatly assist with efforts to target future restoration projects. The Buzzards Bay Project web site contains a copy of the atlas along with other wetlands information for the watershed: www.buzzardsbay.org/smatlasmain.htm.

continued on page 14

Narragansett Bay and Taunton River Tidal Restriction Atlas Underway

MWRP recently signed a cost share agreement with the New England Division of the U.S. Army Corps of Engineers to produce an atlas of tidal restrictions within the Narragansett Bay and Taunton River watersheds. CWRP partner PG&E National Energy Group is providing the 50% match required for the Army Corps cost share.The study area includes approximately 40 miles of Massachusetts coastline and encompasses the intertidal portions of eight towns (Berkley, Dighton, Fall River, Freetown, Rehoboth, Seekonk, Somerset, and Swansea). Using a combination of GIS analysis, consultation with local and state officials, and extensive field work, the Corps will identify and document tidal restrictions within the study area. We anticipate the atlas will be completed by Spring 2003.



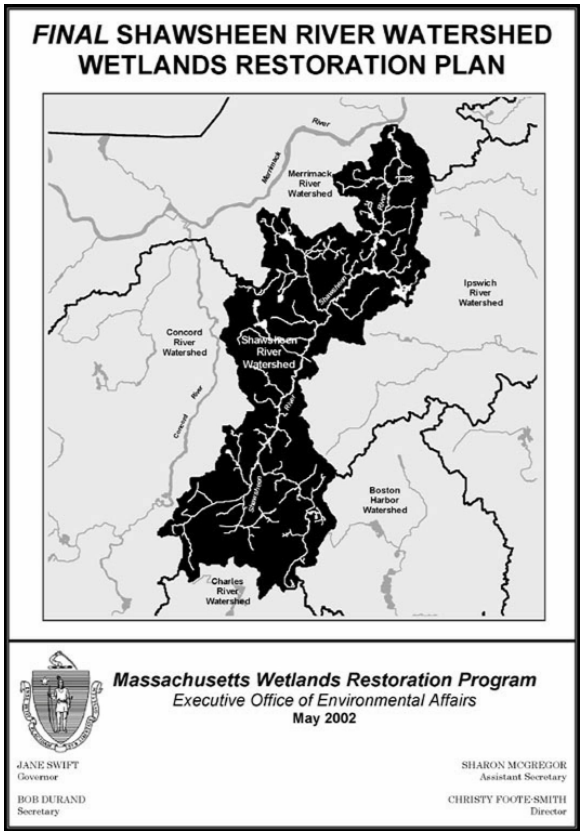


MWRP Seeks Funding for Boston Harbor Intertidal Wetlands Restoration Atlas

Over the summer months of 2002 MWRP entered into discussions with the EOEA Boston Harbor Watershed Team and the New England Branch of the U.S. Army Corps of Engineers regarding production of an atlas of intertidal wetland restoration sites within the Boston Harbor region. CWRP partners Duke Energy, Genzyme and Polaroid Corporation are providing a large portion of the required cost share. Additional funding is still being sought. The Atlas would identify and characterize both tidal restrictions and other historically altered and destroyed coastal wetlands. If full funding is secured for this study, work would likely begin in late 2003.

Shawsheen River Watershed Wetlands Restoration Plan Completed

In May 2002 MWRP completed the *Final Shawsheen River Watershed Wetlands Restoration Plan.* The plan presents the Shawsheen watershed communities with maps and summary descriptions of 63 potential wetland restoration sites. MWRP has determined that these sites likely contain historically damaged or destroyed wetlands that, if restored, could produce significant environmental benefits. The goal of the plan is to help communities locate and assess important restoration opportunities and encourage them to work with MWRP and other restoration partners to complete some of the most promising projects.



The sites identified in the plan are historically destroyed or severely degraded wetlands that offer practical opportunities to restore wetland structure and functions. Within this highly developed watershed, MWRP found that typical restoration opportunities consist of one-half to three-acre areas of historically filled wetlands that are vacant of human structures. Despite the apparent physical restoration potential of these sites, other considerations such as private ownership, the potential presence of contaminants, and high per-acre project costs present new challenges for project sponsors and restoration advocates. MWRP Wetland Scientist Tim Smith will take the lead to help watershed advocates address these challenges and move projects forward.

Two potential restoration projects have already gained momentum. In Lexington, the Lincoln Park management committee has signed a GROWetlands agreement with MWRP and has received $20,000 from MWRP's 2002 GROWetlands Grant Program to conduct a restoration feasibility study. Project components may include daylighting a section of Vine Brook's North Branch that is currently piped underground through the park and removing fill material from adjacent wetlands. In Tewksbury, the Conservation Commission has a pending GROWetlands agreement to explore restoration options for the town's Mollie Drive Conservation Area located on Route 38 directly abutting the Shawsheen River. This project could involve the removal of up to two acres of historic fill that was placed within the river's riparian emergent marsh floodplain. Both of these projects would produce substantial benefits for flood storage, water quality, wildlife habitat and environmental education.

The final plan contains many exciting and environmentally significant wetland restoration opportunities. The challenge now for MWRP, restoration advocates and the watershed communities is to work toward turning these opportunities into results. Our goal is to have several demonstration projects underway within the next year that will provide real-world models of how these types of fill-removal projects actually work. To receive a digital CD copy of the plan in PDF format, email your request to: hunt.durey@state.ma.us.

"[Wetlands restoration in the Shawsheen and other watersheds] is fueled by a growing awareness that environmental damage caused by human changes to the natural landscape has tremendous cumulative and ongoing costs - - costs that, in the case of lost wetlands, include increased flooding, impaired water quality, and degraded habitat for a host of life forms. It is also fueled by our understanding that much can be done to reverse that damage and to restore the vital services that wetlands provide. While our strong permit programs now protect our remaining wetlands, there is a clear need to go beyond the protection of what we have left to the restoration of what used to be."

Environmental Affairs Secretary Bob Durand

Estuarine Habitat Restoration at Cape Cod National Seashore

The Cape Cod National Seashore and cooperating state and federal agencies have been working for 20 years to restore tidal flow to Cape Cod's many diked salt marshes. Cape Cod, like much of the eastern U.S. seaboard, has a 350-year history of coastal wetland loss due to diking, drainage and filling, with an estimated 1400 hectares (ha) of original salt marsh estuaries that are still diked today. Outer Cape Cod (Fig. 1) was not spared; in fact, the four largest diked estuaries on Cape Cod occur in the four Outer Cape "Seashore" towns. With Seashore establishment in 1960, the NPS inherited over 850 ha of diked coastal systems representing a 42% loss of the native salt marsh habitat present at the time of European settlement (Table 1). Diked marshes within the Seashore account for more than half of the total diked wetland area of Cape Cod.

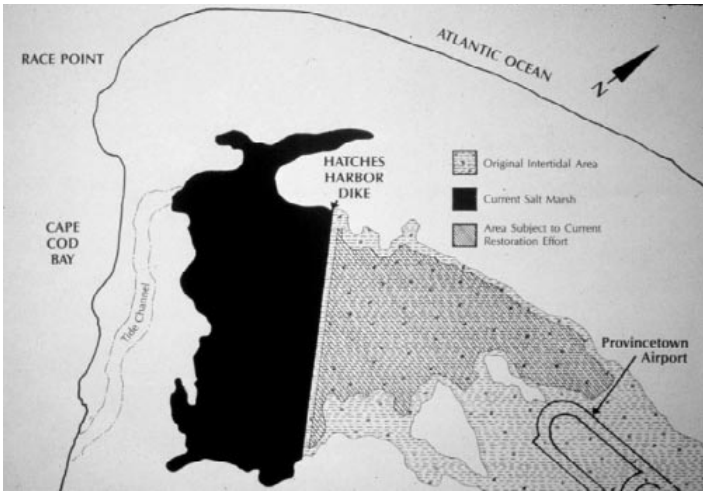


Figure 2. The Hatches Harbor salt marsh. A dike built across the flood plain in 1930 isolated about half of the 420-acre coastal wetland from tidal exchange.

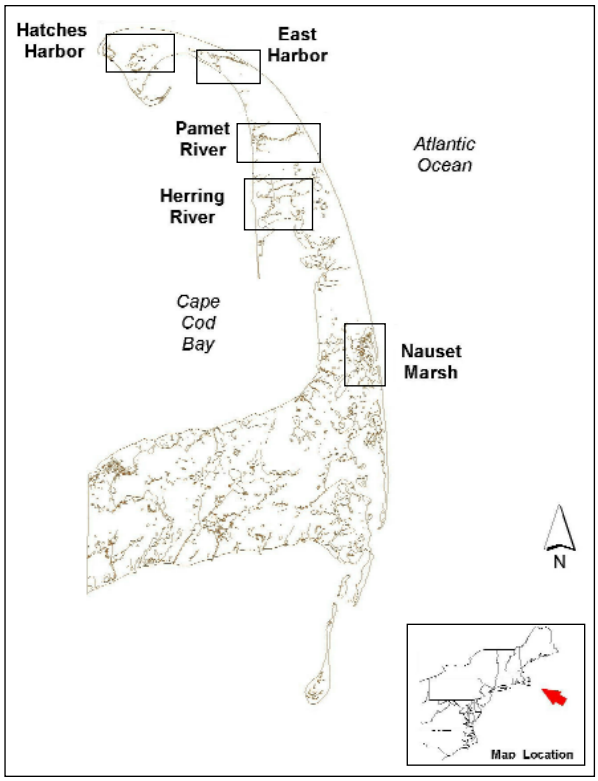


Figure 1. Location of Hatches Harbor and other major estuaries of Cape Cod National Seashore.

With establishment of the National Seashore, the National Park Service (NPS) received stewardship responsibility for most of the marshlands, both diked and natural, within the Park boundary; however, ownership and control of the structures (dikes, culverts, tide gates and weirs) that profoundly affect the salinity, hydroperiod and estuarine ecology of the extensive tidally-restricted marshes was retained by the local towns and the state. Progress in addressing NPS concerns about water management has been slow, but recent efforts to do so at Hatches Harbor in Provincetown have met with success.

A one-kilometer-long dike constructed in 1930 for mosquito control essentially bisected the 400-acre Hatches Harbor flood plain completely blocking tidal exchange and reducing salinity in the landward half of the wetland (Fig. 2). As a result, native salt marsh grasses were replaced by many species of salt-sensitive plants, including 8-10 ha of

Table 1. Extent and duration of tidal restrictions in the Seashore's major estuaries. The Cape Cod Commission estimates that diked salt marshes Cape-wide total 1400 hectares (3458 acres).

Estuary, township	Total area-ha (acres)	Diked area-ha (acres)	Year of diking
East Harbor, Truro	291 (719)	291 (719)	1868
Pamet River, Truro	157 (388)	64 (158)	1869
Herring River, Wellfleet	445 (1,100)	405 (1,000)	1909
Hatches Harbor, Provincetown	170 (420)	80 (198)	1930
Nauset Marsh, Eastham	945 (2,334)	~10 (~25)	?
Totals	2,008 (4,961)	850 (2,100)	

Figure 3. In 1999, these four 3X7-foot culverts were installed in the Hatches Harbor dike, allowing for the gradual re-introduction of tidal flow and restoration of estuarine plant and animal habitats

Phragmites by the 1990s; relict *Spartina* cover in the diked marsh amounted to only about five ha at lowest elevations nearest the tidal creeks. The Provincetown Airport was constructed within the flood plain in the 1940s, i.e., long before park establishment, using the pre-existing dike as protection against tidal flooding.

The need for dike repair in 1986 prompted interagency discussions about the actual flood-protection needs of the airport and the possibility of tidal restoration. Federal Aviation Administration engineers determined critical flooding elevations for airport structures, while NPS scientists and cooperators developed a numerical hydrodynamic model of the estuarine system. The model showed that a wide, low culvert cross-section (eight and one-half meters by one meter) should provide sufficient seawater flooding to restore 25 to 35 ha of salt marsh and, at the same time, dampen storm tides that may otherwise affect the airport's instrument landing system. This culvert configuration and a general restoration plan were approved in 1997 by a planning and regulatory team, pre-restoration monitoring began in summer 1997, and the new culverts (Fig. 3) were installed in the winter of 1998-1999.

Figure 4. Extensive *Phragmites* mortality is evident in this August 2002 photo of the restoring Hatches Harbor flood plain. Vigorous salt marsh cord grass occupies the creek bank. Saltwort and seablite are rapidly colonizing the flats between and within Phragmites patches.

Despite model predictions, the new culverts were not fully opened after construction. Opening has been done in small increments to build confidence among cooperators, especially airport officials, in the reliability of the model, and because of concerns for extensive plant death due to waterlogging should the marsh fail to drain during each low tide. Experience since 1999 has allayed both concerns.

Post-construction monitoring parameters include vegetation, salinity, soil sulfides, mosquito breeding activity, fish usage, and sedimentation. Monitoring results to date indicate significant progress toward achieving project goals. The most obvious result has been the conversion of brackish-water wetland species, e.g., invasive *Phragmites*, and upland species to salt-tolerant halophyte vegetation (e.g., *Spartina* marsh community) (Fig. 4).

Full restoration may take decades. However, periodic monitoring will document gradual changes as the restoring marsh vegetation community becomes more and more similar to an adjacent unrestricted "control" marsh. We predict that continued monitoring will document convergence of the vegetation communities of unrestricted and restoring marshes, thereby providing a quantitative means of tracking the restoration process.

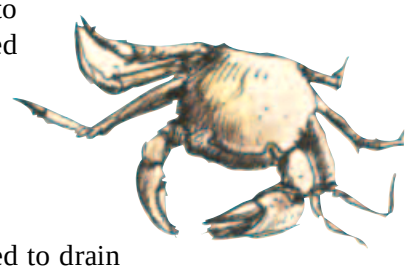
Salt marsh estuaries are complex systems made even more complicated by historic alterations to the governing forces of tidal range and salinity; therefore, the ecological effects of restored tidal flow are not totally predictable. Given this uncertainty, the success of salt marsh restoration efforts at Cape Cod National Seashore, as elsewhere, will depend on our ability to sustain a multidisciplinary monitoring effort as a basis for informed adaptive management. It is especially important to document changes in ecological processes over the long-term so that we can better understand the restoration process and improve our predictive capabilities in the future. In parks like the Seashore with intense public use, adjacent development, and overlapping jurisdictions by agencies with differing management goals, scientifically credible monitoring protocols and results form a critically important basis for improved wetland management.

John W. Portnoy, Cape Cod National Seashore
Charles T. Roman, University of Rhode Island

Note: A longer version of this article that includes detailed information about monitoring methods and results at Hatches Harbor can be found on the MWRP website in PDF format by using the following link:
www.state.ma.us/envir/mwrp/capecodseashorerestorearticle.pdf

Tidal Restrictions: Their Impact on Salt Marshes and How Restoration Can Address Them

Salt marshes need regular ebb and flow of tidal waters to continue their existence. Human activities have created significant restrictions of tidal flow along the Massachusetts coastline. These restrictions threaten the very existence of salt marshes and the important functions they perform.

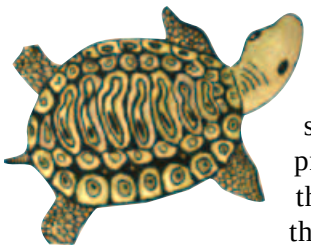


In some instances restrictions were purposeful and designed to drain or "freshen" the marshes. In some locations crossings are on fill (causeways) and function like dams. Consequently, these marshes "dried out" and salts were gradually flushed by freshwater flows. These marshes became brackish or fresh, especially at the upper edges. Many of these areas were used for development or agriculture. Tide gates and dikes also prevent the movement of fish into marshes and their tributaries. Significant numbers of smelt and herring runs have been disrupted in this way.

In other instances the restrictions were inadvertent and the result of roads (either public or private) or railway crossings of the marsh or tidal inlets. In some instances the crossing is on fill (causeways) and functions like a dam. In others, culverts were installed to allow flows, but they are insufficiently sized or at the wrong elevation and limit the inflow of tidal waters. Even where original culverts were of sufficient size, lack of maintenance may have reduced the capacity and caused the flows to become restricted. In all these situations where bridges were constructed across tidal creeks or channels, they too may reduce tidal flow because they are undersized or inappropriately placed.

Culverts that are too small may cause flooding at the downstream side at times of high water or storm tides, or upstream flooding after heavy rainfalls. Undersized culverts also cause higher velocities that can lead to scouring of banks and erosion of the roadbed. Culverts that are at the wrong elevation act as a dam, keeping salt water from entering the marsh or creating pools of fresh water that cannot drain from the marsh.

When tidal influence is limited, changes occur in marsh vegetation. Typically, the area of marsh vegetation is reduced as invasive plants such as common reed *(Phragmites australis)* become established along the marsh edge and then invade the face of the marsh itself. In cases where fresh water is impounded on a marsh for long periods, freshwater emergent plants, such as cat-tails, *(Typha spp.)* may overtake native salt marsh plants. Lack of tidal flow may contribute to accelerated rates of succession when salt marsh grasses and other typical salt marsh plants give way to salt tolerant woody plants, like marsh elder, sooner than in an undisturbed marsh. In all of these instances, habitat quality for salt marsh-dependent fish, birds and other wildlife is reduced and they, in turn, are replaced by more common freshwater-dependent wildlife species.



After tidal flow is restored, typical salt marsh vegetation will usually re-colonize over a period of years. *Phragmites* and other invasive plants gradually become stunted and die back, and native salt marsh grasses return in their place. Normal flooding regimes prevail, allowing higher tides to flood the marsh surface and opening the area as habitat for fish, crabs, invertebrates and the food chains they support.

Glossary and Websites

Click on website links below to go directly to these sites. Please note that you will be leaving the newsletter. To return to the newsletter, use the following website address, www.state.ma.us/envir/mwrp/MWRPFall2002Newsletter.pdf, but allow time for reloading the PDF document.

ACEC – Area of Critical Environmental Concern
www.state.ma.us/dem/programs/acec/index.htm
Buzzards Bay Project National Estuarine Program
www.buzzardsbay.org
CWRP – Massachusetts Corporate Wetlands Restoration Partnership
www.state.ma.us/envir/mwrp/cwrp.htm
DEM – Department of Environmental Management
www.state.ma.us/dem/index.htm
DEP – Massachusetts Department of Environmental Protection www.state.ma.us/dep
Eight Towns & The Bay
http://www.mvpc.org/services_sec/mass_bays/8T%26B.htm
GROWetlands (Groups Restoring Our Wetlands)
www.state.ma.us/envir/mwrp/growetlands.htm
Gulf of Maine Council www.gulfofmaine.org
Inner Cape Cod Bay ACEC
www.state.ma.us/dem/programs/acec/acecs/l-innbay.htm
Massachusetts Bays National Estuary Program
www.state.ma.us/massbays
MassCZM - Massachusetts Coastal Zone Management
www.state.ma.us/czm
MassWildlife www.state.ma.us/dfwele/dpt_toc.htm
MWRP - Massachusetts Wetlands Restoration Program
www.mass.gov/envir/mwrp
NOAA – National Oceans and Atmospheric Administration www.noaa.gov
NOAA Restoration Center
www.nmfs.noaa.gov/habitat/restoration
Parker River National Wildlife Refuge
www.parkerriver.org
Rumney Marshes ACEC
www.state.ma.us/dem/programs/acec/acecs/l-rummar.htm
Sandy Neck/Barnstable Harbor ACEC
www.state.ma.us/dem/programs/acec/acecs/l-sannek.htm

Partners Bring Boat Meadow Creek Project to Construction *continued from page 1*

Installation of new culvert

Deterioration of the culvert and erosion of a retaining wall undermined the bike path and created a safety problem. The Massachusetts Department of Environmental Management, which manages the rail trail, worked cooperatively with Massachusetts Coastal Zone Management and others to address both the safety issue and the tidal restriction. This project was part of a larger effort by DEM and MassHighway to improve the Cape Cod Rail Trail.

Tidal flow has been improved with the installation of a four-foot by six-foot culvert under the bike path. MassCZM has conducted baseline monitoring of the site and will continue to monitor restoration progress at the marsh for several years. The total cost of the project, including follow-up monitoring, is about $200,000.

Salt marsh restoration at Boat Meadow Creek Salt Marsh was successful because of the contributions, support, and participation of many public and private partners including: DEM, MassCZM, MWRP, CWRP (Polaroid, Massachusetts Electric Company, Capaccio Environmental Engineering), Coastal America Partnership (U.S. Fish & Wildlife Service, National Marine Fisheries Service, National Fish & Wildlife Foundation), Town of Eastham and Town of Orleans.

To subscribe to future editions of Massachusetts Wetlands Restoration News, send an e-mail request with the subject "Newsletter" to wetlands.restoration@state.ma.us. Please include your full name and address, as well as afilliation (business or organization), as appropriate.

Corporate Wetlands Restoration News

The Newsletter of the Massachusetts Corporate Wetlands Restoration Partnership
Fall 2002

About CWRP:

In 1999, EOEA, EPA, the Massachusetts Wetlands Restoration Program and The Gillette Company, launched the first public-private partnership for wetlands restoration. The Massachusetts CWRP is providing critical support for ecologically important projects.

CWRP METRICS:

- Number of Corporate Partners: 36
- Technical Services Pledged: $680,826
- Dollars Pledged: $438,500
- Number of Projects being implemented with CWRP support: 27
- On average CWRP contributions generate three times their value in matching governmental funds: $1,702,511

Environmental Services Firms' Donations Boost Restoration Projects

It's been a stellar year for projects receiving technical services from CWRP partners. Companies are providing expertise at 18 different restoration sites. The following examples illustrate the range of critical tasks that partners are performing.

- At Mattapoisett Neck Marsh, the **Daylor Consulting Group** has donated survey, engineering design, and permitting services needed to bring the project to construction.
- North Pool, **Newbury** at the Parker River National Wildlife Refuge, several firms are contributing special skills during the planning stage for the elimination of restrictions to tidal flow for 100 acres of former salt marsh. **Col-East** of North Adams conducted aerial photography and produced photogrammetric maps, **Clipper City Survey** of Newburyport collected survey data at the site and **Normandeau Associates** is assisting with site assessment and restoration alternatives.
- Eastern Point, **Gloucester Judith Nitsch Engineering** is providing a professional land surveyor to assist site planning at this Massachusetts Audubon sanctuary.
- Cow Yard, **Dartmouth** The **Bingham Dana** law firm is preparing permit applications
- Old Town Hill, **Newbury Beals and Thomas** is donating an array of environmental consulting services.
- Bridge Creek, **Barnstable** Geotechinical skills supplied by Weston and Sampson Engineers have helped keep the project on schedule.

Many additional projects await the support of new CWRP partners with relevant technical experience. *(See next page for services needed.)*

"Our CWRP experience has been put to use for our private clients on projects that will guide future wetlands restoration projects in the local community. This has been a win-win program for the state and for the environment."
Margaret Briggs, Managing Principal of Epsilon Associates, Inc., a Charter Member of CWRP.

Photo courtesy of The Gillette Company

During August 2002, forty high school students and teachers helped EPA scientists aboard EPA's ocean survey vessel Anderson as it collected marine data from the depths of Massachusetts Bay off Boston Harbor. This fun and educational event was sponsored by the federal agencies of the Coastal America Partnership and funded by CWRP partners Duke Energy, ERM-New England, and The Gillette Company.

CWRP-Sponsored Restoration Projects Need Your Company's Services!

- Hydraulic/Hydrologic Studies (tidal studies, culvert sizing, modeling, stream assessments)
- Field Surveys
- Civil Engineering (design, construction specifications, drawing preparation)
- Geotechnical Investigations
- Fisheries Habitat Studies
- Project Permitting Services
- Site Work (earthwork, erosion control, site stabilization, installations)
- Construction Project Management & Inspection

See contact information on next page.

New Projects Proposed for CWRP Support

Park Street Salt Marsh, Saugus, North Coastal Watershed:
7-acre restoration near completion needs equipment and services to relocate 15,000 cubic yards of material.

Herring River, Wellfleet, Cape Cod Watershed:
Restoration project to improve 800 acres of salt marsh needs engineering, permitting and construction for dike to replace an historic breached dike.

State Game Farm, Sandwich, Cape Cod Watershed:
8 acres of tidally-restricted salt marsh needs survey, design and permitting services, and construction.

"Thank you", to New England's Environment for their article on CWRP in the August issue (http://www.environews.com/)

Two Completed Projects Are Dedicated on Cape Cod

Wings Neck Salt Marsh Restoration Thanks to the timely donation of CWRP technical services by Cape Cod firms **Warwick & Associates** and **Stephen J. Doyle & Associates**, eight acres of salt marsh upgradient of Wings Neck Road in Bourne enjoyed significant tidal exchange for the first time in years. The installation of a larger-size culvert took less than a week, but local residents had worked diligently for several years, with support from MWRP, to piece together the $110,000 project budget. The two CWRP partners helped move the project from planning through the design and permitting stages. Public partners (Town of Bourne, MWRP, Natural Resources Conservation Service and the Buzzards Bay Project) helped cover major costs of engineering and construction. Additional private support from local neighborhood associations and the FishAmerica Foundation helped reach the funding goal.

Boat Meadow Creek Salt Marsh Restoration A collapsed culvert on DEM's Cape Cod Rail Trail provided an opportunity to increase tidal flow to six acres of salt marsh on the Orleans/Eastham line. CWRP donations totaling $15,300 from **Polaroid**, **Mass Electric Company** and **Capaccio Environmental Engineering** helped offset costs of installing a new culvert as part of trail safety improvements. At the July 16th dedication event staged at the project site along the trail, Environmental Affairs Secretary Bob Durand hailed the project as a prime example of how partnerships can accomplish several environmental goals with the same dollar. Trail users will enjoy an improved bikeway, fish will enjoy an expanded habitat, and the coastal zone will benefit from a more viable salt marsh. Bob Capaccio remarked, "CWRP allows even the smaller firm's contributions to make a difference in preserving the environment. For our 10th anniversary, my employees wanted to show our clients that all of us can make a difference in these vital wetland restoration efforts."

Project partners gather to celebrate completion of Wings Neck restoration. From left, local advocate Bob Birtz, MWRP Director Christy Foote-Smith, CWRP donor Barbara Frapier, Bourne Conservation Director Matt Boulanger, Bourne Selectman James Grady, and MWRP Wetland Scientist Steve Block.

CWRP Corporate Partners

**New Partner*

Battelle
Beals and Thomas*
BSC Group
Capaccio Envir. Engineering
Clean Harbors
Clipper City Survey*
Col-East*
Cyn Environmental
Daylor Consulting Group*
Duke Energy
Earth Tech
ECAP
ENSR International
Epsilon Associates
ERM Group Foundation
ERM-New England
Genzyme
Great Meadow Farm*
Jacques Whitford*
Massachusetts Electric
New England Development*
Normandeau Associates
Northeast Utilities System*
NSTAR
Polaroid Corporation
PG&E National Energy Group
Raytheon Company
Stephen J. Doyle & Associates
The Foxboro Company
The Gillette Company
The Louis Berger Group
Vanasse Hangen Brustlin
Warwick & Associates
Weston & Sampson Engineers*
Wheelabrator Saugus*

Other Contributors:
Bingham Dana, LLP

Herring River salt marsh.

CWRP is seeking partners to contribute funds or technical services for engineering and design, permitting and construction of a dike to replace an historic dike at Mill Creek, a tributary of the Herring River, that has been breached This is the first step in a multi-phase project that may ultimately restore up to 800 acres of salt marsh in Wellfleet.

Contact us:

Susan Redlich,
CWRP Manager
Tel. 617-292-5676
susan.redlich@state.ma.us
www.mass.gov/envir/mwrp/cwrp